

ECE390 Winter 2017

Project Overview

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WATERLOO
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Project Milestone

Part I "Proposal" (15min presentation):

- 1. Project overview
- 2. Objectives
- 3. Proposed methodology
- 4. Group organization

Part II "Analysis" (20 min presentation):

- 1. Economic analysis
- 2. Execution analysis
- 3. Environmental impact
- 4. Social impact

Sample Project Discussion

LIGHT RAIL TRANSIT:PUBLIC SECTOR DECISION MAKING

Project Overview

- In June 2003, the Waterloo Regional Council unanimously adopted the Regional Growth Management Strategy (RGMS), a long-term strategic plan for accommodating future residential and employment growth [1]. The RGMS concluded that rapid transit was a necessity, as “continuing with road expansion alone was not a realistic or affordable option to manage growth” [1] (see Figure 1).

Project Overview



Figure 1: Typical Cross-Section for On-Road Rapid Transit Passageway [2]

Project Overview

- Light Rail Transit (LRT), as shown in Figure 2, was approved as the preferred solution by the Waterloo Regional Council in 2009.
- Public opinions surrounding implementation of the new transit system were collected from September 2010 until May 2011 and it was found that the main concerns included:
 - cost implications,
 - health and environmental impacts, and
 - the impact on the community.



Figure 2: LRT Concept on Caroline St. currently (left),with LRT (centre), with LRT and urban growth (right) [3]

Project Objective

- As a resident engineer of the Waterloo Region, you must decide whether you do or do not support the preferred LRT option using appropriate financial analysis to help evaluate the best option.

Proposed Methodology: Region of Waterloo Transit Alternatives

- The Region of Waterloo has a pressing need to address rapid population growth anticipated in the near term, which will include significant improvement to its current transit system capacity.
- The projected growth for the Waterloo region is upwards of 10,000 people per year.
- Current bus passenger boardings per weekday in the central transit corridor include 29,200 northbound passengers from Fairview Park Mall and 6,400 southbound passengers from Fairview Park Mall [2].

Proposed Methodology: Region of Waterloo Transit Alternatives

- The current passenger demand for bus services is being met, however, it is predicted the number of buses needed to meet demand will exceed road capacity north of Fairview Park Mall in the peak period within 20 years [2].

Proposed Methodology: Region of Waterloo Transit Alternatives

To address this problem, the main transportation options being considered are:

- 1) Business-as-usual
- 2) Bus Rapid Transit (BRT)
- 3) LRT, implemented in stages with adapted Bus Rapid Transit (aBRT)

Proposed Methodology: Region of Waterloo Transit Alternatives

- The business-as-usual option means that the road network would need to expand by at least 500 additional lane-kilometres by 2031.
- The BRT option would have buses in dedicated lanes with a full standing capacity of 75 passengers (standard) or 115 passengers (articulated).

Proposed Methodology: Region of Waterloo Transit Alternatives

- In comparison, the LRT two-car trains would have a full standing capacity per train of up to 450 passengers.
- The aBRT implementation would encompass curbside rapid transit stations, frequent and limited stop service, signal priority, and queue jumping.

Problem Statement

- There is public information available on cost implications, as well as social, environmental, and economic considerations.
- A number of community stakeholders have begun to endorse certain options over others and there are many newspaper articles published on this topic.
- How will you, as a resident engineer of the Waterloo Region, decide which transit option you will support for the community's future?

References

- [1] Region of Waterloo. (2011). *Frequently Asked Questions* [Online]. Available:
<http://rapidtransit.region.waterloo.on.ca/faq.html>
- [2] "Rapid Transit Implementation Options," Region of Waterloo Transportation and Environmental Services, Waterloo, Canada, Rep. E-11-021, Feb. 2011.
- [3] Region of Waterloo. (2011). *Videos & Visuals* [Online]. Available:
<http://rapidtransit.region.waterloo.on.ca/videos-visuals.html>

Group Organization

Part II

- Compare costs and benefits that occur at different times (I.e. present worth, future worth)
- Create cash flow patterns of costs and benefits
- Identify and apply social aspects of engineering decision making
- Identify and measure costs and benefits of public projects, including environmental, social, political, and economical factors

Part II

- Address ambiguous benefit-cost scenarios
- Apply a multi-criteria decision making approach
- Communicate “technical” terms effectively to the public (stakeholders)